

The Atlas Copco logo, featuring the company name in a white serif font, centered between two horizontal white bars on a blue background.

Atlas Copco

The background of the entire page is a high-contrast, blue-toned photograph of a laser cutting process. A bright, intense light from the laser head is focused on a metal workpiece, creating a massive spray of glowing orange and yellow sparks that radiate outwards. The laser head itself is a dark, industrial-looking structure positioned at the top of the frame. The overall scene conveys a sense of precision and industrial power.

Refrigerant air dryers

F+ Premium series (330-4170 l/s, 700-8830 cfm)



Why dry your compressed air?

Compressed air is used in a wide variety of industrial applications. Wherever it is used, compressed air must be clean and dry. Containing solid, liquid and gaseous contaminants, untreated compressed air poses a substantial risk as it can damage your air system and end product. Moisture, one of the main components of untreated air can cause corrosion in pipe work, premature failure of pneumatic equipment, product spoilage and more. An air dryer is therefore essential to protect your systems and processes.

Limit the risks of moisture

When the air that surrounds us is compressed, its water vapor and particle concentration increases dramatically. For example, compressing ambient room air to 7 bar(e)/100 psig increases the vapor content or humidity by a factor of around 8, and subsequent cooling forms liquid water.

The amount of water depends on the specific application. Compressed air can actually contain three forms of water: liquid water, aerosol (mist) and vapor (gas). An efficient means of removing water from compressed air is therefore vital.

Moisture in the air can be particularly problematic, causing:

- Corrosion of compressed air piping.
- Damages & malfunction of air powered equipment.
- Compressed air leakages due to corroded pipes.
- Poor paint quality, deterioration of electrostatic painting processes.
- Deteriorated end product quality.





Protecting your reputation and production

Removing moisture from compressed air with a dewpoint as low as +3°C/+37.4°F, F+ refrigerant dryers provide the clean, dry air you need to expand the life of your equipment and ensure the quality of your end product.

Keeping your production up and running

F+ dryers are designed in-house, tested using the most stringent methods (at ambient temperatures up to 45°C/113°F) and manufactured on a very advanced production line.

F+ dryers meet or exceed the international standards for compressed air purity and are tested according to ISO 7183:2007.

Driving down energy costs

Our F+ dryers incorporate a range of energy-saving features that will cut your carbon footprint and reduce costs. Incorporating unique heat exchanger technology and Saver Cycle Control, the F+ ensures a low pressure drop of typically below 0.2 bar/2.9 psi and minimal energy consumption.

The integrated Variable Speed Drive (VSD) technology offers extra energy savings by automatically tuning the energy input to the precise demand.

Easy installation and long maintenance intervals

F+ dryers have a small footprint thanks to an innovative all-in-one design. Delivered ready for use, installation is straightforward, minimizing costly production downtime.

F+ dryers come as all-in-one packages including an electronic no-loss drain.

Low environmental impact

Fully compliant with ISO 14001 standards and Montreal Protocol regulations, F+ dryers use CFC-free and HCFC-free refrigerants (R410A) to prevent any damage to the earth's ozone layer.

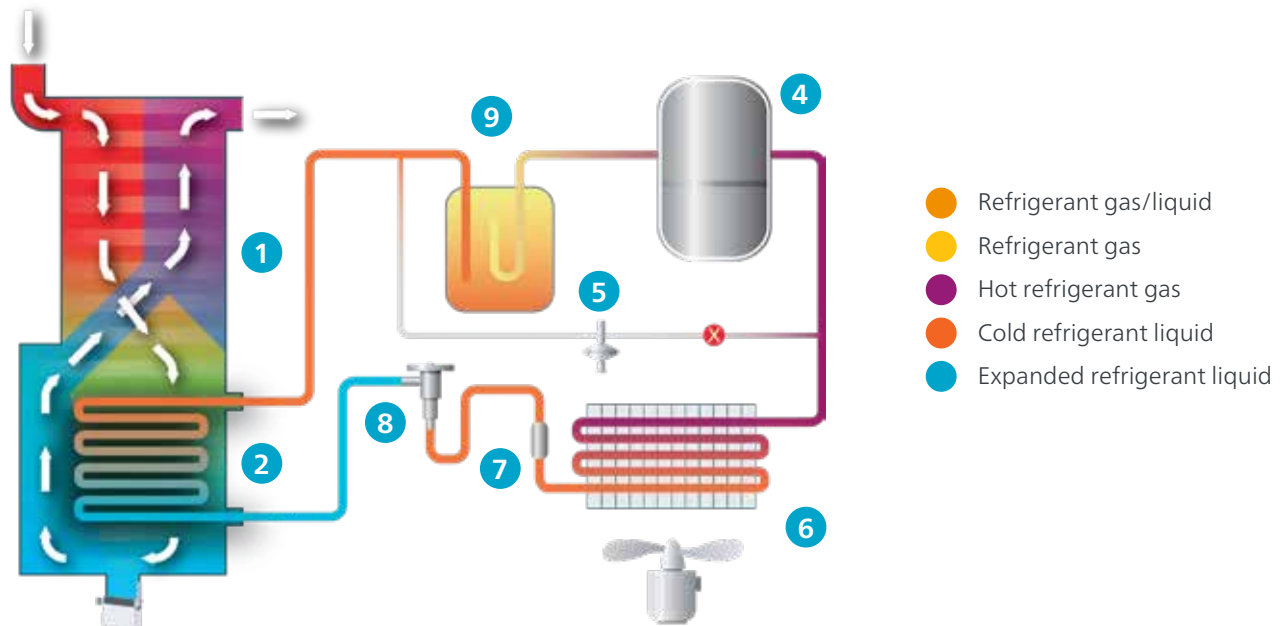
F+ dryers have an ozone depletion potential (ODP) of zero and are enclosed in a sound suppression canopy to reduce the noise levels, making F+ dryers among the most environmentally friendly and quietest in their class.

How does the F+ (VSD) dryer work?

A refrigerant dryer uses a refrigerant circuit and heat exchanger(s) to pre-cool air, refrigerate it to condense out moisture vapor, and then re-heat the air to prevent pipe sweating downstream. Refrigerant dryers can lead to a pressure dewpoint (PDP) as low as +3°C/+37.4°F for many applications where there is a need for dry air. They can be used at different pressures and consume no processed compressed air.

In almost every production environment, compressed air flow fluctuates depending on different factors (time of the day, week or even months). In addition to fluctuation of compressed air flow, operational temperatures such as ambient and compressed air temperature may vary. VSD technology allows the F+ VSD dryers not only to save energy at full load, but also to save a significant amount of energy at partial load or under lighter working conditions.

Typical working principle of direct expansion dryers



Air circuit

- 1 Air-to-air heat exchanger: Incoming air is cooled down by the outgoing dry cold air
- 2 Air-to-refrigerant heat exchanger: The air is cooled to the required dewpoint by the refrigerant circuit. The water vapor condenses into water droplets
- 3 Integrated water separator: The moisture is collected and evacuated by the electronic drain



Refrigerant circuit

The refrigerant removes the heat from the compressed air and cools down to the desired dewpoint.

- 4 Refrigerant compressor: Compresses the gaseous refrigerant to a higher pressure
- 5 Regulation device: The hot gas bypass valve regulates the dryer to prevent freezing at lower load conditions
- 6 Refrigerant condenser: Cools the refrigerant so that it changes from a gas to a liquid
- 7 Refrigerant filter: Protects the expansion device from harmful particles
- 8 Thermostatic expansion valve: The expansion process reduces the pressure and cools the refrigerant further
- 9 Liquid separator: Ensures that only refrigerant gas enters the compressor

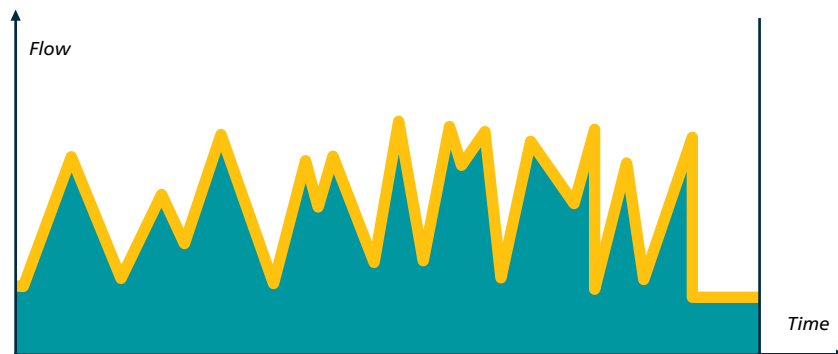
Atlas Copco's F+ refrigerant dryers

Based on years of experience in the industry, we have chosen to incorporate direct expansion technology with cycling, non-cycling and Variable Speed variants in its range.



Direct expansion dryers without Saver Cycle Control (non-cycling)

- Applications: stable dewpoint, full load applications.
- Key advantage: fixed speed dryers run continuously to ensure a stable dewpoint by design (irrespective of varying load conditions).
- Range: F 330+-850+.



Variable speed dryers (VSD = Variable Speed Drive)

- Applications: varying temperatures, varying flows.
- Key advantage: VSD dryers match the energy consumed to the actual compressed air used. This ensures supreme energy saving as well as a stable dewpoint across the whole spectrum of temperature and flow.
- F 1000+-4170+ VSD.

Supreme energy efficiency

When purchasing a refrigerant dryer, the main focus is usually on the initial cost. What is mostly overseen is that this only represents approximately 10% of the lifecycle cost, the rest being taken up by energy, maintenance and installations costs. Of these, direct and indirect energy costs (pressure drop) are the most important.

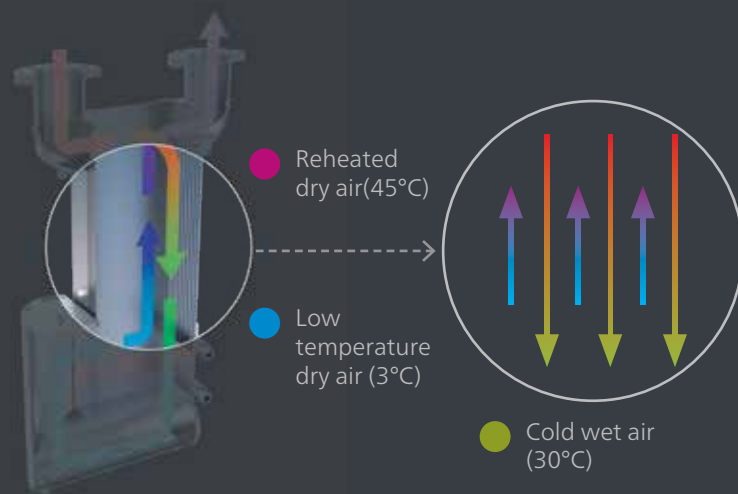
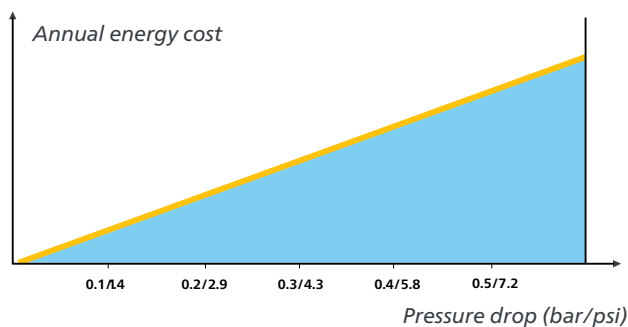
Indirect energy costs

Indirect energy costs are related to the extra energy your air compressor will consume to overcome the pressure drop of the air dryer. By design, Atlas Copco F+ refrigerant dryers offer a low pressure drop and efficient heat transfer – both of which contribute to a reduction of the indirect energy costs.

Low pressure drops

If a refrigerant dryer has a high internal pressure drop, the compressor needs to run at a higher pressure. As illustrated in the example, this wastes energy and increases operating costs. Atlas Copco has therefore put considerable efforts into minimizing pressure drops in its dryers. A low pressure drop of typically below 0.2 bar/2.9 psi at full flow is ensured by the heat exchanger technology, an integrated low velocity water separator, and generously sized components.

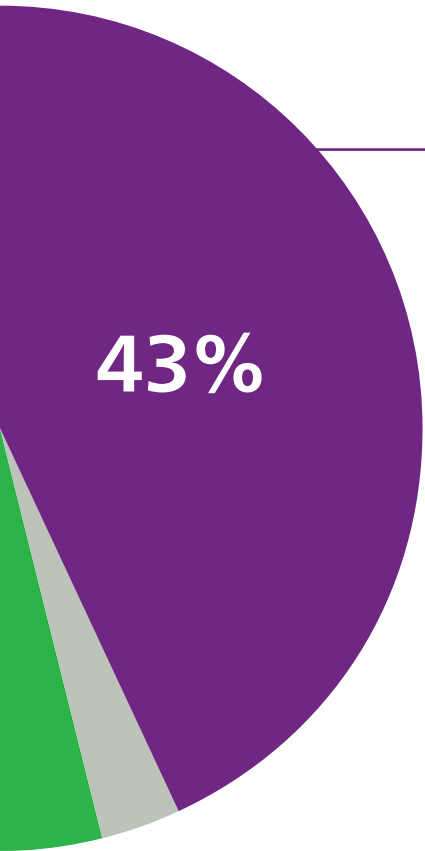
Example of the costs related to high pressure drop



Efficient heat transfer through unique heat exchanger technology

The F+ dryer uses a counter flow heat exchanger on both the air-to-air and air-to-refrigerant side. Compared to a cross flow heat exchanger, the counter flow design results in a more efficient heat transfer and stable temperatures. This significantly lowers energy consumption.

38%



43%

Direct energy costs

Direct energy costs are related to the power that the dryer consumes. Atlas Copco's F+ dryers incorporate a variety of state-of-the-art technologies such as Saver Cycle Control and Variable Speed Drive. These features result in further savings on energy costs, depending on your air consumption profile.

Saver Cycle Control

To help you save energy, Atlas Copco F+ dryers are able to adapt their working cycle to the real load by continuously monitoring and comparing the ambient temperature and the pressure dewpoint. When there is less heat load, the refrigerant compressor stops and power consumption is significantly reduced.

Variable Speed Drive (VSD)

The VSD controller incorporated in certain F+ refrigerant dryers matches the energy consumed to the actual compressed air used. This significantly reduces energy consumption – by as much as 70% compared to conventional dryers.

It works by varying the speed of the compressor and ensuring a stable dewpoint. In this way the speed of the refrigeration compressor can be matched to inlet conditions, resulting in lower energy consumption at reduced loads.

Lifecycle cost

- Direct energy costs
- Indirect energy costs
- Investment
- Maintenance
- Installation

Reduce your total lifecycle cost by up to

50%

with Atlas Copco's
F+ dryers

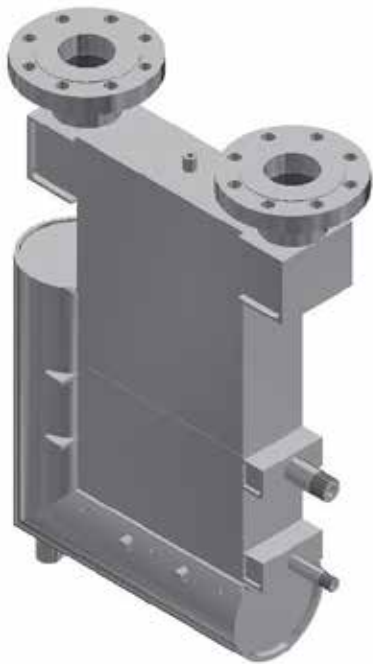
- Up to 50% savings on indirect energy costs
- Up to 70% savings on direct energy costs

F330+~850+: Superior productivity



Electronic no-loss condensate drain

- Level sensor senses the level of the condensate and opens the drain, preventing any loss of compressed air when condensate is drained.
- Equipped with backup manual drain as standard and drain alarm (F330+~850+).



High-efficiency heat exchanger

Counter-flow aluminum (F330+~850+) heat exchanger, with air-to-air side for optimum cooling efficiency.



Optimum performance and safety in all conditions

- Hot gas bypass valve prevents freezing at lower loads.
- Extremely reliable R410A rotary compressor (330+) or high-performance R410a scroll compressor (F410+~850+) provide the best performance for each size while having minimum environmental impact. Thermal expansion valve cope with all conditions – keep system stable based on requirement.
- F330+~850+ also offer condenser with plate fin technology for improved performance in dusty environments.



Robust and compact design

- Forklift opening for easy transport.
- Easily removed side panels for full access.
- Options: ANSI flange connection.



** The type of controller may vary depending on the model.*

Advanced control and monitoring system

- The controller displays the pressure dewpoint (PDP) and relative humidity.
- Setting allows dryer to restart or not after power failure.
- Remote alarm and start/stop control through voltage-free contact.
- The controller offers additional features such as alarm history, standard remote visualization (Ethernet plug) and communication extension possibility.

Fan switch

Reduces energy consumption and optimizes the pressure dewpoint at very low temperatures.

F1000+~4170+ VSD: Superior productivity

High-efficiency heat exchanger

- Counter-flow on both air-to-air and air-to-refrigerant sides for efficient heat transfer. As the outgoing air is reheated, it protects the outlet piping against pipe sweating.
- Unlike some other dryer designs, a separate pre-filter is not required. This results in a low pressure drop. The design ensures a smooth air flow which makes the dryer less sensitive to contamination.

Integrated water separator

- Low velocity condensate separator with high separation efficiency even in low flow conditions.
- Reliable and effective condensate evacuation from the separation chamber via the no-loss condensate drain.



Electronic no-loss condensate drain

Level sensor senses the level of the condensate and opens the drain, preventing any loss of compressed air when condensate is drained, which is the case with timer-based drains.





VSD compressor

Regulation of the refrigerant compressor based on actual load

Hot gas bypass valve

Regulation of evaporating pressure based on actual load



** The type of controller may vary depending on the model.*

User-friendly state-of-the-art Elektronikon® controller

- Monitoring of all parameters to ensure maximum reliability for your installation.
- Fitted inside a real IP54 cubicle for easy cabling and safety.

A step ahead in monitoring and controls

Atlas Copco's Elektronikon® controls and monitors your F+ refrigerant dryers to ensure optimal productivity and efficiency at your site.

User-friendly interface

Available in 32 languages, this graphical 3.5-inch highdefinition color display with pictograms and LED indicators for key events is easy to use. The keyboard is durable to resist tough treatment in demanding environments.

Comprehensive maintenance display

Valuable items of information displayed include the Service Plan indicator and preventive maintenance warnings.



Internet-based visualization*

The Elektronikon® system monitors and displays key parameters such as dewpoint and inlet temperature, etc. Internet-based visualization of your dryer is possible by using a simple Ethernet connection.



SMARTLINK*: Data Monitoring Program

- A remote monitoring system that helps you optimize your compressed air system and save you energy and cost.
- It offers you a complete insight in your compressed air network and anticipates on potential problems by warning you up-front.

** Please contact your local sales representative for more information.*



Optimize your system

With the F+, Atlas Copco provides an all-in-one standard package incorporating the latest technology in a built-to-last design. To further optimize your F+'s performance or to simply tailor it to your specific production environment, optional features are available.

Scope of supply

Avoid risk of corrosion and system leaks and ensure the effective safe disposal of untreated condensate – all within ISO 14001 standards.

Cooling circuit	Integrated electronic no-loss drain
Electrical components	Elektronikon® control
	Voltage-free contacts for remote alarm signal
	Digital pressure dewpoint readout
Mechanical components	Counter-flow air-to-air heat exchanger
	Counter-flow air-to-refrigerant heat exchanger

Additional features & options

		F33+~850+	F1000+~4170+VSF
Motor	VSD control	-	√
	Saver Cycle Control	-	√
Other options	Pressure dewpoint alarm	√	√
	High pressure alarm	√	√
	High temperature alarm	√	√
	Automatic hot gas bypass valve	√	√
	Automatic thermostatic expansion valve	√	√
	ANSI flange connection	•	•

• : Optional √ : Standard - : Not available

Refrigerant content

Dryer type	Quantity R410a	CO ₂ equivalent
	kg	ton
Air-cooled version 50Hz		
F330+	2.3	4.8
F410+	4.5	9.4
F600+	5	10.4
F750+	7	14.6
F850+	7.5	15.6
F1000+ VSD	8	16.7
F1250+ VSD	9	18.8
F1670+ VSD	10.5	21.9

Dryer type	Quantity R410a	CO ₂ equivalent
	kg	ton
Water-cooled version 50Hz		
F330+	2.3	4.8
F410+	4.5	9.4
F600+	5	10.4
F750+	7	14.6
F850+	7.5	15.7
F1000+ VSD	8	16.7
F1250+ VSD	9	18.8
F1670+ VSD	12	25.0
F2100+ VSD	14	29.2
F2500+ VSD	17	35.5
F3300+ VSD	20	41.7
F4170+ VSD	25	52.2

Technical specifications

Dryer type	Maximum inlet conditions at full flow (ambient/ inlet)	Inlet flow			Pressure drop		Power consumption 50Hz		Max. working pressure		compressed air connections	Dimensions canopy						Weight	
												mm			in				
	°C	l/s	m³/h	cfm	bar	psi	kW	hp	bar	psi		L	W	H	L	W	H	kg	lb
Air-cooled 50Hz																			
F330+	45/55	330	1188	700	0.15	2.2	3.85	5.24	13	191	G2 1/2	1025	660	1120	40.4	26.0	44.1	180	397
F410+	45/55	410	1476	870	0.15	2.2	4.3	5.85	13	191	DN100	1025	1000	1700	40.4	39.4	66.9	325	717
F600+	45/55	600	2160	1270	0.15	2.2	5.22	7.10	13	191	DN100	1025	1000	1700	40.4	39.4	66.9	350	772
F750+	45/55	750	2700	1590	0.15	2.2	6.13	8.34	13	191	DN150	1450	1000	1900	57.1	39.4	74.8	550	1213
F850+	45/55	850	3060	1800	0.15	2.2	7.64	10.39	13	191	DN150	1450	1000	1900	57.1	39.4	74.8	600	1323
F1000+ VSD	45/55	1000	3600	2120	0.15	2.2	6.1	8.30	13	191	DN150	1750	1000	1950	68.9	39.4	76.8	670	1477
F1250+ VSD	45/55	1250	4500	2650	0.15	2.2	7.12	9.69	13	191	DN150	2050	1000	1950	80.7	39.4	76.8	750	1653
F1670+ VSD	45/55	1670	6000	3532	0.18	2.61	8.82	12.00	13	191	DN200	2100	1350	2100	82.7	53.1	82.7	900	1984
Water-cooled 50Hz																			
F330+	45/55	330	1188	700	0.15	2.2	3.43	4.67	13	191	G2 1/2	1025	660	1120	40.4	26	44.1	205	452
F410+	45/55	410	1476	870	0.15	2.2	3.6	4.90	13	191	DN100	1025	1000	1550	40.4	39.4	61	325	717
F600+	45/55	600	2160	1270	0.15	2.2	4.36	5.93	13	191	DN100	1025	1000	1550	40.4	39.4	61	350	772
F750+	45/55	750	2700	1590	0.15	2.2	4.83	6.57	13	191	DN150	1450	1000	1750	57.1	39.4	68.9	550	1213
F850+	45/55	850	3060	1800	0.15	2.2	6.34	8.63	13	191	DN150	1450	1000	1750	57.1	39.4	68.9	600	1323
F1000+ VSD	45/55	1000	3600	2120	0.15	2.2	4.34	5.9	13	191	DN150	1750	1000	1750	68.9	39.37	68.9	670	1477
F1250+ VSD	45/55	1250	4500	2650	0.15	2.2	5.4	7.35	13	191	DN150	2050	1000	1750	80.7	39.37	68.9	750	1653
F1670+ VSD	45/55	1670	6000	3532	0.18	2.61	7.1	9.66	13	191	DN200	2100	1350	2000	82.7	53.15	78.7	900	1984
F2100+ VSD	45/55	2100	7500	4410	0.18	2.61	8.57	11.66	13	191	DN200	2100	1350	2100	82.7	53.15	82.7	1000	2205
F2500+ VSD	45/55	2500	9000	5300	0.18	2.61	10.12	13.77	13	191	DN200	2500	1350	2100	98.4	53.15	82.7	1200	2646
F3300+ VSD	45/55	3300	12000	7000	0.18	2.61	13.22	17.99	13	191	DN250	2500	1900	2100	98.4	74.803	82.7	1800	3968
F4170+ VSD	45/55	4170	15000	8830	0.18	2.61	17.71	24.1	13	191	DN250	2500	1900	2100	98.4	74.803	82.7	1900	4189

- Reference conditions:
Performance data per ISO 7183:2007
- Ambient temperature: 25°C, 77°F
 - Cooling water temperature: 32°C, 89.6°F
 - Inlet compressed air temperature: 35°C, 95°F
 - Inlet pressure: 7bar(e), 102 psig
 - Inlet compressed air humidity: 100%



Driven by innovation

With more than 135 years of innovation and experience, Atlas Copco will deliver the products and services to help maximize your company's efficiency and productivity. As an industry leader, we are dedicated to offering high air quality at the lowest possible cost of ownership. Through continuous innovation, we strive to safeguard your bottom line and bring you peace of mind.



Building on interaction

As part of our long-term relationship with our customers, we have accumulated extensive knowledge of a wide diversity of processes, needs and objectives. This gives us the flexibility to adapt and efficiently produce customized compressed air solutions that meet and exceed your expectations.



A committed business partner

With a presence in over 170 countries, we will deliver high-quality customer service anywhere, anytime. Our highly skilled technicians are available 24/7 and are supported by an efficient logistics organization, ensuring fast delivery of genuine spare parts when you need them. We are committed to providing the best possible know-how and technology to help your company produce, grow, and succeed. With Atlas Copco you can rest assured that your superior productivity is our first concern!

